AMENDMENTS TO THE CLAIMS

1. (currently amended) ~~In a~~ A system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having an audio signal modulated onto the ultrasonic frequency, comprising:

audio signal processing circuitry ~~comprising~~including:

~~a~~ delay means for the audio signal providing a delayed audio signal;

envelope generator means providing an envelope signal which is ~~a function of~~ responsive to negative peaks of the audio signal over a predetermined interval; and

combiner means for the delayed audio signal and the envelope signal, the resulting combined signal being useful in processing for modulation of said ultrasonic frequency; and

premodulation processing means for processing the combined signal including the delayed audio signal and the envelope signal, thereby allowing the propagation medium demodulation to provide a demodulated acoustic signal which is a substantially accurate representation of the audio signal.

2. (currently amended) The ~~audio signal processing circuitry~~system of claim 1 wherein at least one of said delay means and said envelope generator means comprise analog circuitry.

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3. (currently amended) The ~~audio processing circuitry~~system of claim 1 wherein at least ~~on~~ one of said delay means and said envelope generator means comprise digital circuitry.

4. (currently amended) The ~~audio processing circuitry~~system of claim 3:

wherein both said delay means and said envelope generator means ~~are~~ comprise digital circuitry; ~~and~~

wherein means are provided for providing digital sampling of said audio signal, thereby providing a digitized audio signal;

wherein said delay means delays ~~said audio signal~~ N samples of said digitized audio signal; and

wherein said envelope generator means examines M prior samples of said digitized audio signal.

5. (currently amended) The ~~audio processing circuitry~~system of claim 4 wherein N and M are set at values to align the digitized audio signal to corresponding times in the envelope signal.

6. (original) The ~~audio processing circuitry~~system of claim 1 further including a low pass filter for the envelope signal and

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having a settling time or group delay where ~~the~~ a delay interval corresponds to a settling time or group delay of the ~~Low~~ low pass filter.

7. (canceled)

8. (currently amended) The system of claim ~~7~~ 1 wherein said premodulation processing means generates an approximate square root function on the combined signal.

9. (currently amended) The system of claim ~~7~~ 1 wherein said premodulation processing means processes said combined signal by a polynomial expansion of a predetermined number of terms.

10. (currently amended) The system of claim ~~7~~ 1 wherein said premodulation processing means processes said combined signal by use of a precalculated lookup table.

11. (currently amended) The system of claim ~~7~~ 1 wherein said premodulation processing means includes upsampling and low pass filter means to provide an enhanced bandwidth prior to premodulation processing.

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12. (original) The system of claim 1 further including up sampling and low pass filter means prior to any modulation.

13. (currently amended) The system of claim ~~7~~ 1 wherein, in response to the negative peaks of the audio signal, said premodulation processing means provides for dynamic polarity reversal of the combined, processed signal prior to modulation at one or more specified times within a predetermined interval, thereby reducing bandwidth of the modulated ultrasonic frequency.

14. (currently amended) The system of claim 13 wherein said one or more specified times corresponds to ~~polarity reversal is a function of~~ one or more of ~~the~~ criteria that the ~~combined~~ unmodulated, processed signal as applied to the premodulation processing means is:

close to a zero value;

has a relatively high slope;

has a short-time power spectrum estimate that indicates a wide bandwidth; and

has a slope that is near a zero value while a rate of change of the slope is positive.

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15. (original) The system of claim 1 further including means for ultrasonically modulating the combined signal.

16. (original) The system of claim 15 further including means for projecting ultrasonic sound wave representations of the modulated combined signal.

17. (original) The system of claim 16 wherein said projecting means includes amplifier means and transducer means.

18. (original) The system of claim 17 further including means for providing an offset bias in the modulated signal.

19. (currently amended) The system of claim 18 wherein said offset bias maintains the modulated signal in a predetermined polarity.

20. (currently amended) In a system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having an audio signal modulated onto the ultrasonic frequency, audio signal processing circuitry comprising:

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envelope generator means for tracking negative peaks of the audio signal over a predetermined interval and inverting the negative peaks , thereby providing an envelope signal which is an approximate function of the inverted negative peaks of the audio signal over ~~a~~ said predetermined interval, said ~~approximatie~~approximate function having ~~misaligment~~misalignment of the envelope signal and the audio signal; and

means for converting the audio signal and the envelope signal into an ultrasonic signal characterized by a carrier signal and reduced misalignment.

21. (currently amended) The audio signal processing circuitry ~~system~~ of claim 20 wherein said converting means includes means for delaying the audio signal.

22. (currently amended) The audio signal processing circuitry ~~system~~ of claim 20 wherein said converting means includes means for adjusting the level of said carrier signal to reduce said misalignment.

23. (currently amended) In a system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having an

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original audio signal modulated onto the ultrasonic frequency, an audio signal ~~a~~ processing method comprising the steps of:

delaying the original audio signal to provide a delayed audio signal;

generating an envelope signal which is ~~an approximate function of~~ responsive to negative peaks of the audio signal over a predetermined interval~~, said approximation having misaligment of envelope and audio signal~~;

combining the delayed audio signal and the envelope signal to produce a combined signal useful in processing for modulation of said ultrasonic frequency; and

~~converting~~ in a processing step, processing the combined signal including the delayed audio signal and the envelope signal~~, into an ultrasonic signal characterized by a carrier signal and reduced misalignment~~ thereby allowing the propagation medium demodulation to provide a demodulated acoustic signal which is a substantially accurate representation of the original audio signal.

24. (canceled)

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25. (currently amended) The method of claim 23 wherein said ~~converting~~ processing step includes the step of adjusting the level of ~~said~~ a carrier signal to ~~reduce~~increase tolerance for ~~said~~ misalignment of the envelope signal and the audio signal.

26. (new) The audio signal processing circuitry of claim 20 wherein said means for converting includes means for providing for polarity reversal of the unmodulated, combined, processed signal at one or more specified times within a predetermined interval in response to negative peaks of the audio signal, thereby reducing frequency bandwidth of the modulated ultrasonic signal.

27. (new) The method of claim 23 wherein said processing step includes the step of providing for polarity reversal of the combined, processed signal prior to modulation at one or more specified times within a predetermined interval in response to the negative peaks of the audio signal, thereby reducing bandwidth of the modulated ultrasonic frequency.

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